

CITY OF LLANO

ELECTRIC DEPARTMENT POLICIES AND PROCEDURES LLANO CITY UTILITY ORDINANCES# 681, #695, #1293 NEC 70 of 2017

ALL NEW CONSTRUCTION AND SERVICES, THE LOCATION OF METER LOOPS SHALL BE INSPECTED AND APPROVED BY THE CITY OF LLANO ELECTRIC DEPARTMENT BEFORE ANY CONSTRUCTION BEGINS.

METER LOCATIONS:

- a. For residences, meter sockets shall be located on, external walls so that meter (s) will be accessible for reading, inspection or testing without entering the building. Future building modifications or structural changes shall not make meters and associated equipment inaccessible from the same property. A confirmation of service must be obtained from the City of Llano Electric Service Department prior to any installations.
- b. For multi-residential, commercial and industrial buildings, outdoor meter locations are preferred. No meter socket or equipment shall be installed in any location not readily accessible from same property. When adequate exterior wall space is not available, a separately locked meter room accessible from outside the building through one door must be provided. The Department must be supplied with a key to that room which will be installed in a lock box adjacent to the door. Future building modifications or other structural changes shall not render the meters and associated equipment inaccessible. Customers shall consult the Department for approved locations and obtain a service confirmation prior to any installations.
- c. For multi-occupancy buildings, all meters and metering equipment are to be grouped in one central location that is readily accessible 24 hours a day to City of Llano Electrical Department personnel.
- d. For reason of public safety, maintenance of service, and reliability of metering, the Electric Department has determined **certain meter locations to be table therefore no meter socket or service equipment shall be located:**
 1. Inside any building, unless located within an acceptable meter room.
 2. In any place where moisture, corrosive fumes, dust or similar deteriorating agents are present which may interfere with the operation of the meter, materially damage it or **present hazard to the electric department personnel occupied in servicing, testing or reading of such meter.**
 3. On the exterior of any wall or structure located so that less than three feet of clearance is provided in front of all metering equipment and its enclosing cabinets from property lines, public thoroughfares, alley, driveways and walks.
 4. In any location not readily accessible 24 hours a day for reading, maintenance, inspection, testing or replacement of the metering equipment by electric department.
 5. In any location which is hazardous or unsuitable for entry by meter readers or service personnel, (i.e. uncontrolled or unrestrained animals, in any area that is not accessible, via a clear stairway normal tread end rise, etc.)
 6. In any security area protected by alarm systems, security gales or doors.
 7. On buildings, occupancies or other structures that are not directly served by the electric department service connection.
 8. In single-family carports or garages.
On any portion of a building where future landscaping, fencing, structural changes or modifications will make the meter(s) inaccessible or hinder clearances.
 10. On poles owned and maintained by the customer
 11. In any patio area that could factor be enclosed, thus preventing access to the meter and weather head.
 12. In any elevator shaft, hatchway or room containing elevator equipment.
 13. In any substation or transformer vault, unless such meter is in an enclosure which is effectively shielded from the high voltage compartment and contains no bare or exposed energized part.
 14. Behind a switchboard having bare and exposed live energized parts, unless such meter is located at least five feet from such parts and is effectively shielded there from.
 15. Directly over any plumbing fixtures
 16. Directly over any stairway, ramp or steps.
 17. On any balcony or mezzanine floor or in basement, cellar or underground room
 18. On any surface subject to excessive vibration as determined by the Electric Department
 19. In an unlighted enclosed area.
 20. Directly over or within three feet of any gas meter.

Wiring Specifications

Electrical facilities will be installed and maintained in accordance with the National Electric-Code. (or City of Llano rules, whichever is more stringent) City of Llano reserves the right to inspect consumer wiring. Inspection by City of Llano and/or provision of electric service do not indicate or certify that the consumer wiring is safe or adequate or meets code requirements.

1. General Requirements for Meter Loops

- a. Meter loops must be built with the proper size conduit, EMT, or rigid metal conduit, have a main disconnect, and have a grounding electrode.
- b. A main disconnect may consist of 6 or less fusible switches or circuit breakers., so long u all can be operated from one accessible location and are installed below the meter.
- c. Meter loops must have proper grounding. (NEC article 250)
- d. Size of copper or aluminum wires in meter loops will be determined by the load to be served and the National Electric Code. Temporary loops and meter loops on buildings should have at least #6 copper or #4 aluminum; water pump loops Should use at least #10 copper or #8 aluminum. City of Llano recommends that the neutral conductor be the same size as the phase conductors, especially where power quality is an issue.
- e. Permanent meter loops serving any type of building or structure must have at least a 60-amp main and a panel capable of providing 240-volt service. Nameplate ratings on manufactured homes will be followed.
- f. Meter sockets should be located between 5 and 6 feet above the permanent ground line. There must be at least twelve feet of clearance to the conductor drip loop coming out of the weather head. Loops shall be tall enough to allow proper ground clearance for service drop wires (15 feet over residential areas and private driveways, 18 feet over alleys, commercial driveways and land traversed by vehicles, 22 feet over public roads).
- g. The owner or builder must provide an adequate tic point for the service drop on metal or masonry buildings.
- h. A two-inch diameter service mast of rigid metal conduit is the minimum when going through a roof for clearance. The mast and weather head may extend from 30 to 42 inches above the roof but still needs to meet the requirements of 1.f.
- i. All mains or weatherproof gutters installed above die meter should have provisions for locking with a city lock.
- j. Temporary melter loops should be weatherproof and have at least ten feet of clearance to the drip loop wires coming out of the weather head. The post supporting a temporary construction loop should be set to a proper depth and/or be well-braced. Ground-fault protection will be provided for personnel at temporary service locations in accordance with article 30S-6 of the National Electric Code. Temporary loops may be disconnected after 30 days.
- k. Large meter loops (100+ amps) may be built with the breaker boxes on each side of the meter base instead of below it.

2. Wiring Guidelines

- a. Receptacles must be connected with 3 wires and grounded.
- b. Frames of fixed equipment and appliances must be grounded.
- c. Proper cable, wiring, materials, and equipment will be used in all locations, including those that involve special conditions such as moisture, high temperature explosion hazards, earth contact, or sensitive electrical devices.
- d. Circuit breakers and/or fuses will be sized according to the National Electric Code and to the load being served.
- e. #14 copper should only be used to control individual room lights, relays, or control circuits not exceeding 10 amps.
- f. Wires should not be exposed or unprotected. Proper connectors or clamps must be used at all boxes, panels, and mains. Raceways and conduits win be used where required.
- g. There should be no more than 7 receptacles or lights on any one general purpose circuit individual circuits will be provided for all major appliances. Special circuits should be provided where appropriate.

ACCORDING TO ORDINANCE NO. 750 SECTION III #1 INADEQUIT FACILITIES, ALL EXISTING METER LOOPS MUST PASS THE EXISTING METER LOOP INSPECTION.

Existing Meter Loop Inspection

Single level structure or multi-level structure where meter location doesn't permit compliance with pole mounted loop procedures:

All existing meter Loops must:

- (1) Be a minimum of 10' from the permanent ground level to the drip loop.
- (2) Be a minimum of 24" from the roofline to the top of the mask and in 2" ridged conduit (if through eave).
- (3) Meter base set between 5' and 6' from the permanent ground level below.
- (4) Have three properly sized individual conductors in EMT or ridged conduit, no range cable triplex or any other multi conductor cable will be permitted.
- (5) Have a ground wire attached to an 8' driven ground rod. (#6 bare copper wire)
- (6) Have all wiring exiting the meter loop properly protected.
- (7) Have an open 24" radius clear of any obstructions (i.e. shrubs, fence, enclosure) in front of meter base.

Multi-level structure or any pole, be it wood, steel or concrete (all meter poles will be supplied by the City.)

All existing meter loops must:

- (1) Be a minimum of 17' from ground level to top of mast.
- (2) Have 3 properly sized individual conductors in EMT or ridged conduit, no range cable, triplex, or any other multi-conductor cable will be permitted.
- (3) Have the appropriate size and approved main disconnect below the meter. Disconnect must have 12" of ground wire. (#6 bare copper wire)
- (4) Meter base set between 5' and 6' from the ground level below.
- (5) Have all wiring exiting the meter loop properly protected.
- (6) Have an open 36" radius, clear of any obstructions (i.e. shrubs, fences, enclosures) in front of meter base.

Any existing service that does not meet code shall be expected to meet current codes with the service entrance being at least 12 foot and a main disconnect on the outside of the residence.

Unsafe conditions will be determined by the City of Llano.

Exception: Where rock bottom is encountered, ground rod may be driven at an angle, not more than 45 degrees, or buried in a 2 ½' deep by 8" trench (NEC 250.83CJ)

Meter loops that are accepted temporarily under special conditions that do not meet required specifications should have up to ninety (90) days from the date of notice to make necessary changes. If upgrades are not made by the ninety (90) day period service will then be disconnected.

Utility service may be disconnected for any of the following reasons:

- (1) Failure to discontinue or correct a known dangerous or unwarranted condition.
- (2) Inability to obtain reasonable access to utility meters.
- (3) Violation of city utility regulation or ordinances,
- (4) Theft of service,
- (5) Tampering or evidence of tampering

****NOTE:** Homeowners may perform electrical work on their "HOMESTEAD", (A permit and inspection is still required) All other electrical work must be performed by an electrician licensed by the City of Llano.

••NOTE: The seal on any City of Llano electric meter may not be removed unless the Electric Department is first notified and approves the removal. If a seal is removed without proper authorization this will constitute tampering and the customer may be disconnected. If you have any questions, please feel free to call Code Enforcement at (325)247-4158.

Please DO NOT attach any item to utility poles. This includes satellite dishes, TV antennas, fences, garage sale signs, basketball goal, clotheslines, etc. Any item attached to a pole which causes a hazard to an employee may be removed at the customer's expense.

CONDUCTOR

TYPES AND SIZES

TYPES RH-RHH-RHW-THHW-THW-THWN-XHHW CONDUCTORS

MAIN DISCONNECT ... PANEL RATING	COPPER AWG	ALUMINUM OR COPPER CLAD ALUMINUM AWG
60AMP	#6	#4
100AMP	#4	#2
125AMP	#2	# 1/0
150AMP	#1	# 2/0
200AMP	# 2/0	#4/0
225AMP	# 3/0	#250MCM
250AMP	#4/0	#300MCM
300AMP	#250MCM	#350MCM
350AMP	# 350MCM	# 500MCM
400AMP	#400MCM	#600MCM

Refer to current version of the National Electric Code to determine

conduit size necessary for type of conductor used.

CONSTRUCTION TEMPORARY METER POLE

Temporary Loops can only be used as temporary and may be disconnected after 30 days

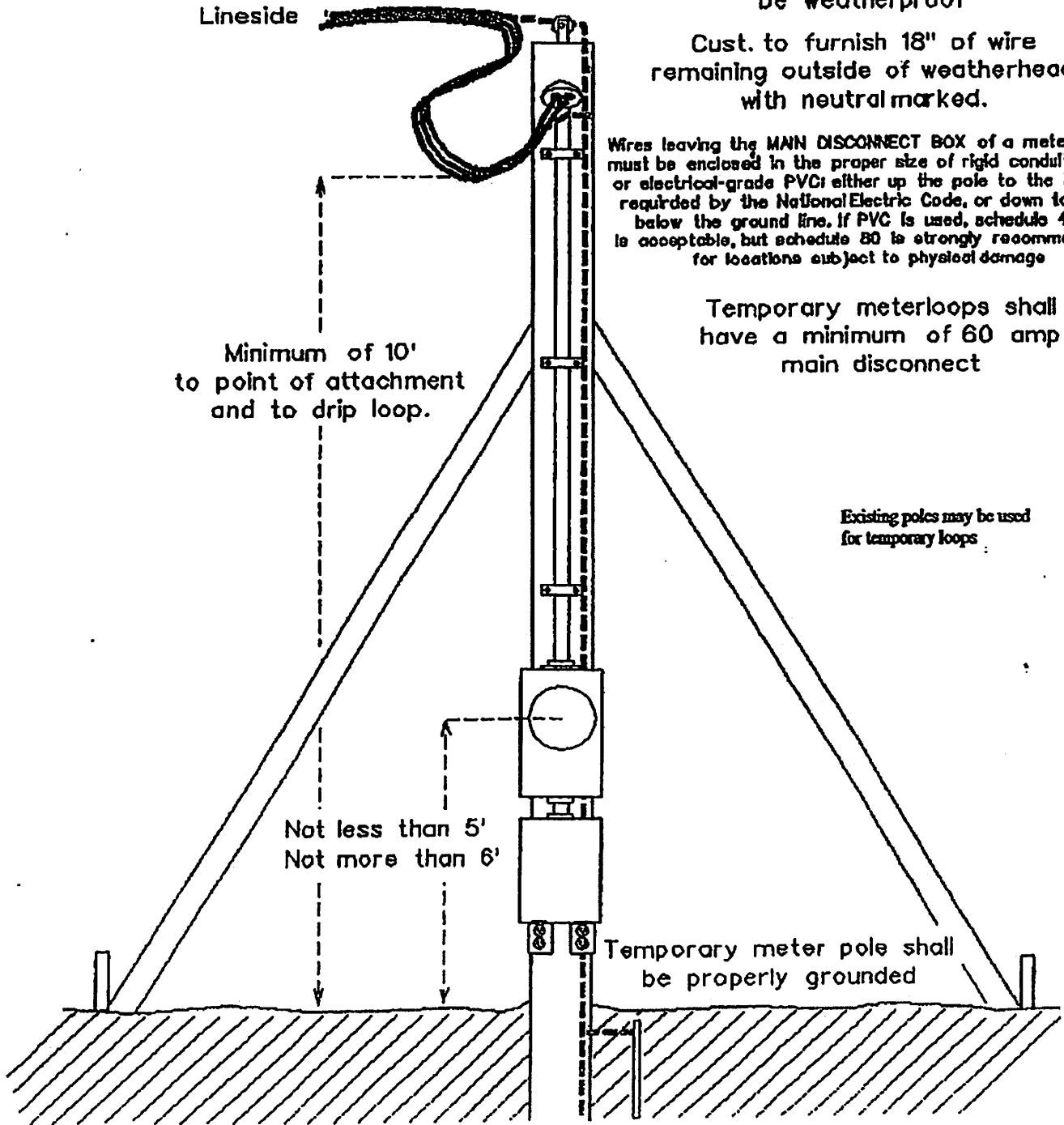
Complete installation must be weatherproof

Cust. to furnish 18" of wire remaining outside of weatherhead with neutral marked.

Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT or electrical-grade PVC; either up the pole to the height required by the National Electric Code, or down to 18" below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

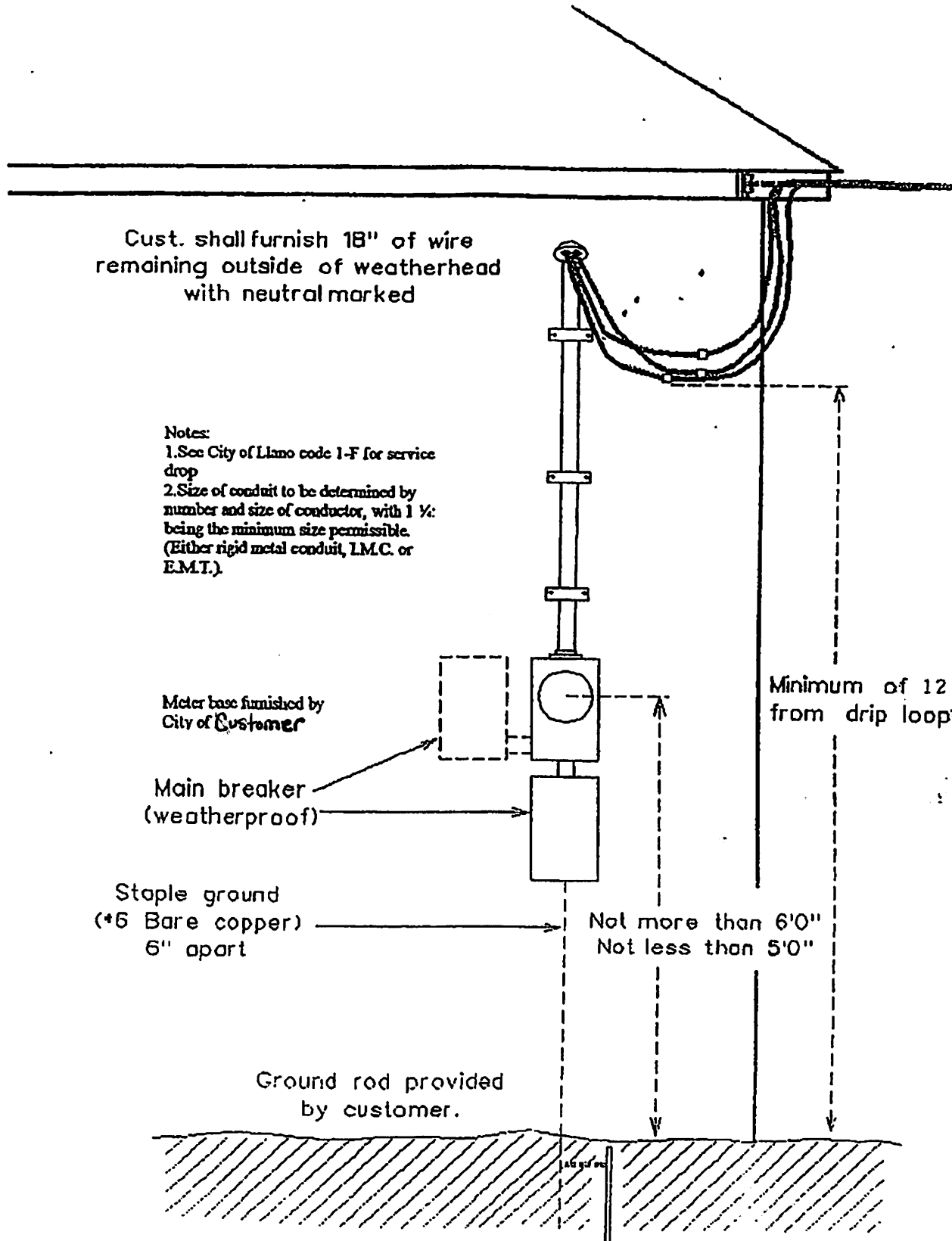
Temporary meterloops shall have a minimum of 60 amp main disconnect

Existing poles may be used for temporary loops

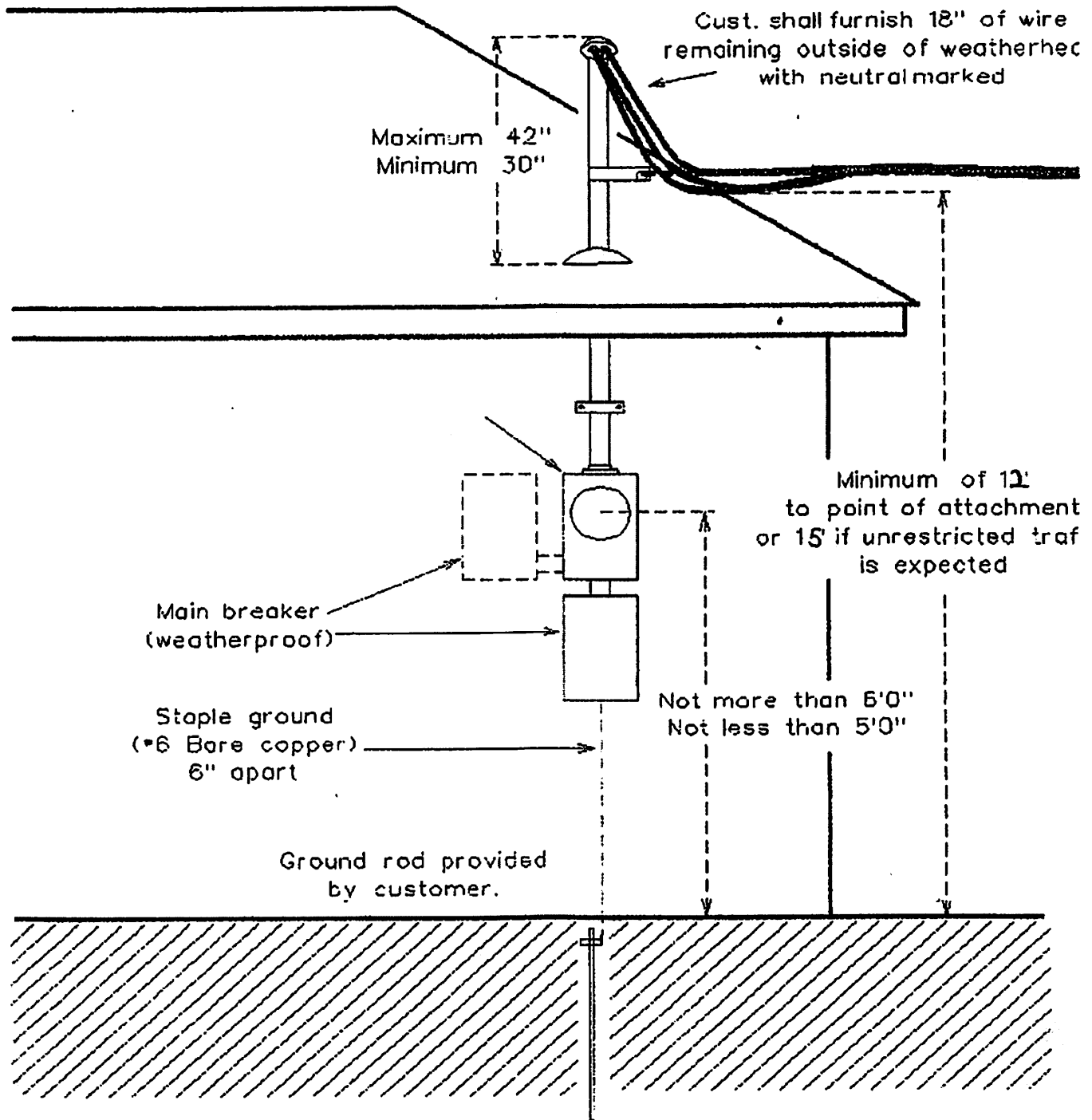


Temporary meter pole shall be properly grounded

SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING WITH HIGH EAVES

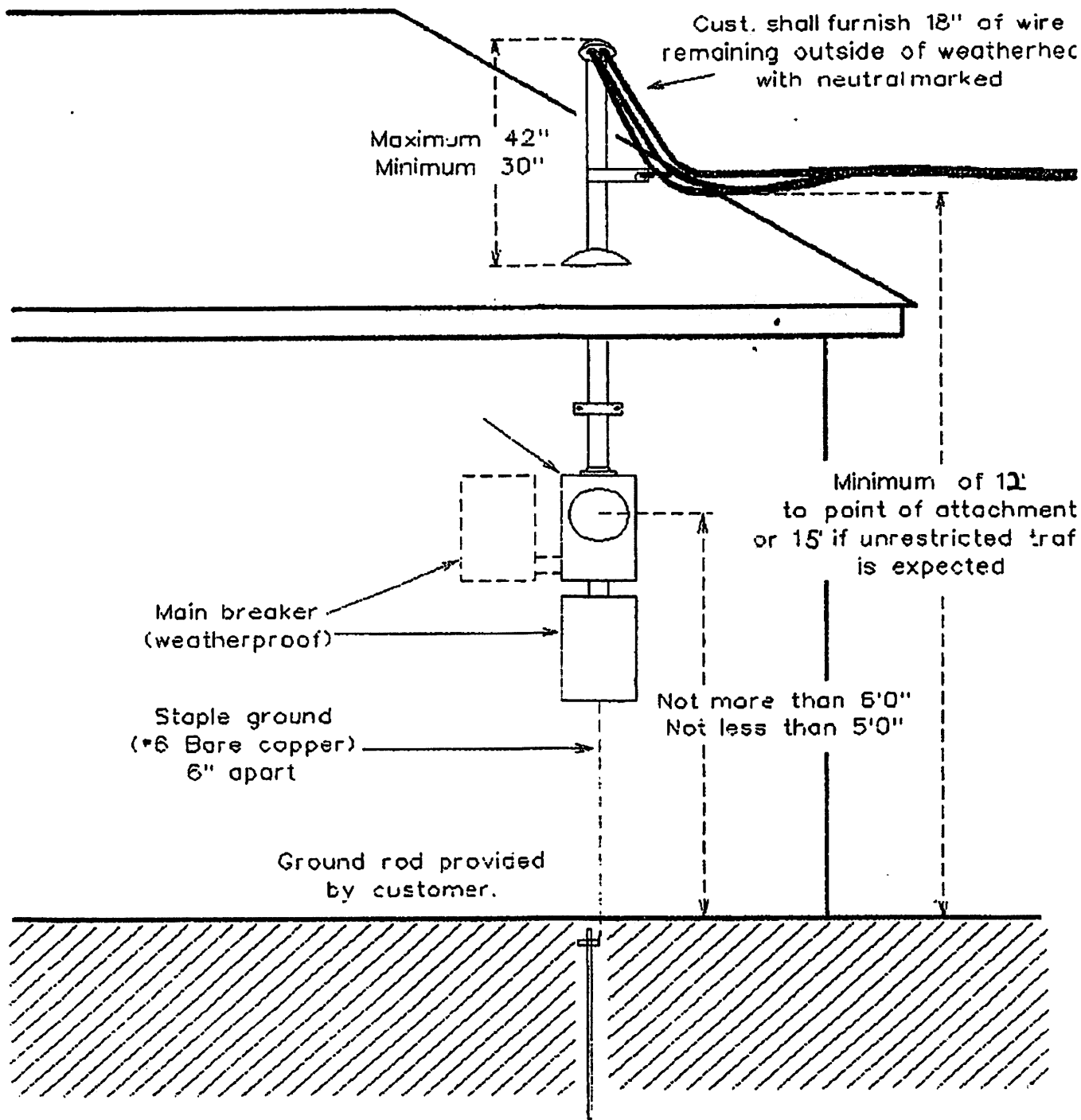


SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING



Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT, or electrical-grade PVC: either up the pole to the height required by the National Electric Code, or down to 24" below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING



Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT, or electrical-grade PVC: either up the pole to the height required by the National Electric Code, or down to 24" below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

METERLOOP MOUNTED ON POLE

Pole furnished and set by City of Llano

Complete installation must be weatherproof

Size of conduit to be determined by number and size of conductors.
(Rigid metal conduit, I.M.C. or E.M.T.)

Note: Three conduit straps and stand-offs (when needed) shall be furnished by customer

Motor base with proper hole size shall be furnished by customer

Cust. shall furnish 18" of wire remaining outside of weatherhead with neutral marked.

Pole height Conduit length

30'

17'

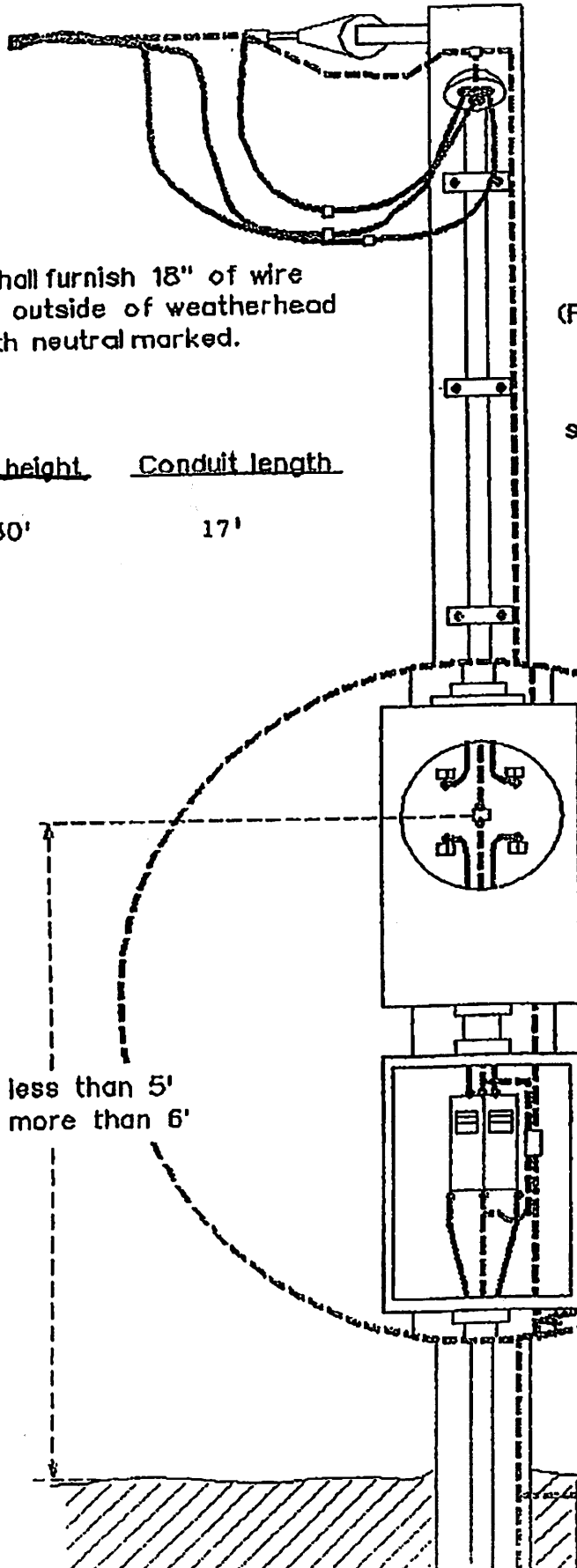
Not less than 5'
Not more than 6'

Conductor size and breaker sizes will be in accordance with service load.

Cust. to furnish a minimum of 12" of #6 bare copper extending out of breaker box to be connected to neutral bar, for grounding. Bar must be grounded to breakerbox.

Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, E.T. or electrical-grade PVC, either up the pole to the height required by the National Electric Code, or down 10 2" below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

Ground rod provided by City of Llano



City of Llano

METERLOOP MOUNTED ON POLE

Cust.

Cust. shall furnish 18" of wire remaining outside of weatherhead with neutral marked.

Pole furnished and set by City of Llano

Complete installation must be weatherproof

Size of conduit to be determined by number and size of conductors.
(Rigid metal conduit, I.M.C. or E.M.T.)

Note: Three conduit straps and stand-offs (when needed) shall be furnished by customer

Meter base with proper hub size shall be furnished by Customer

Wires leaving the MAIN DISCONNECT BOX of a meterloop to serve a load with overhead service cannot be brought up the same riser as the wire to be connected up to the line side. Wire must be enclosed in the proper size of rigid conduit or EMT up the pole to the height required by the National Electric Code,

Conductor size and breaker sizes will be in accordance with service load.

Cust. to furnish a minimum of 12" of #6 bare copper extending out of breaker box to be connected to neutralbar, for grounding. Bar must be grounded to breakerbox.

Pole height Conduit length

30'

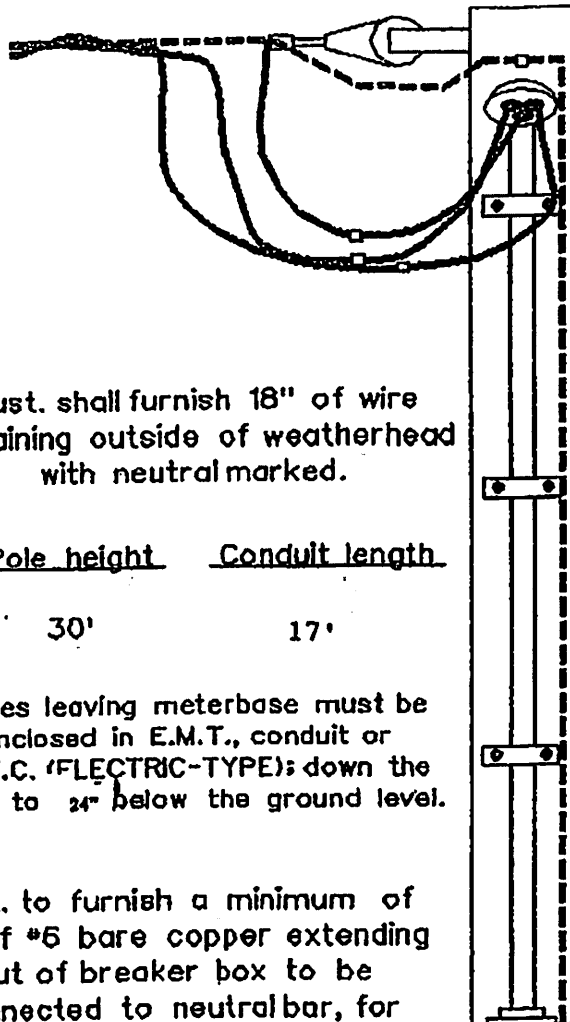
17'

Not less than 5'
Not more than 6'

Ground rod provided by City of Llano

METER RACK MOUNTED ON POLE

City of Llano



Pole furnished and set by City of Llano

Complete installation must be weatherproof

Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT or electrical-grade PVC; either up the pole to the height required by the National Electric Code, or down to 18" below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

Note: Three conduit straps and stand-offs (when needed) shall be furnished by customer

Metal gutter provided by customer. Must have provisions for placing a City of Llano lock

Stub pole and bracing provided by customer

Conductor size and breaker sizes will be in accordance with service load.

Meter base with proper hub size to be furnished by customer

Cust. shall furnish 18" of wire remaining outside of weatherhead with neutral marked.

Pole height Conduit length

30'

17'

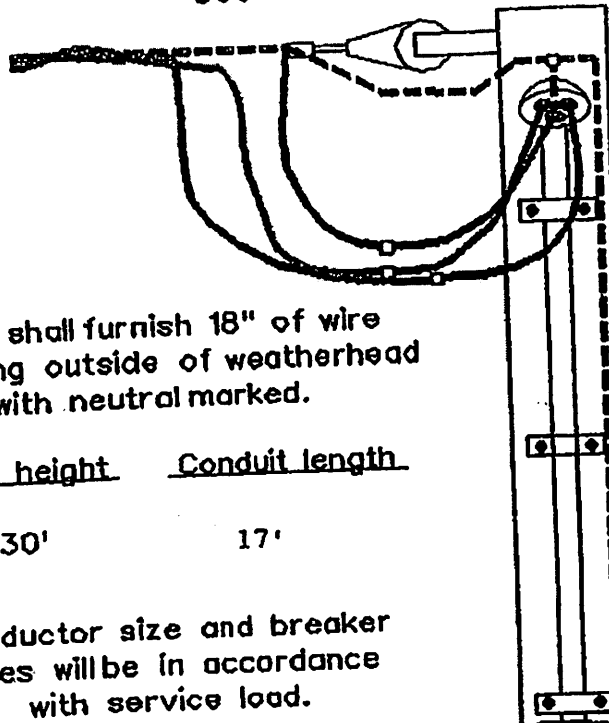
Wires leaving meterbase must be enclosed in E.M.T., conduit or P.V.C. (ELECTRIC-TYPE); down the pole to 24" below the ground level.

Cust. to furnish a minimum of 12" of #6 bare copper extending out of breaker box to be connected to neutral bar, for grounding. Bar must be grounded to breakerbox.

Not less than 5'
Not more than 6'

Ground rod provided
By City of Llano

300 - 400 AMP SERVICE MOUNTED ON POLE



Cust. shall furnish 18" of wire remaining outside of weatherhead with neutral marked.

<u>Pole height</u>	<u>Conduit length</u>
30'	17'

Conductor size and breaker sizes will be in accordance with service load.

Pole furnished and set by City of Llano
 Complete installation must be weatherproof

Size of conduit to be determined by number and size of conductors.
 (Rigid metal conduit, I.M.C. or E.M.T.)

Note: Three conduit straps and stand-offs (when needed) shall be furnished by customer

Meter base with proper hub size shall be furnished by Customer

Main Disconnect (weatherproof)

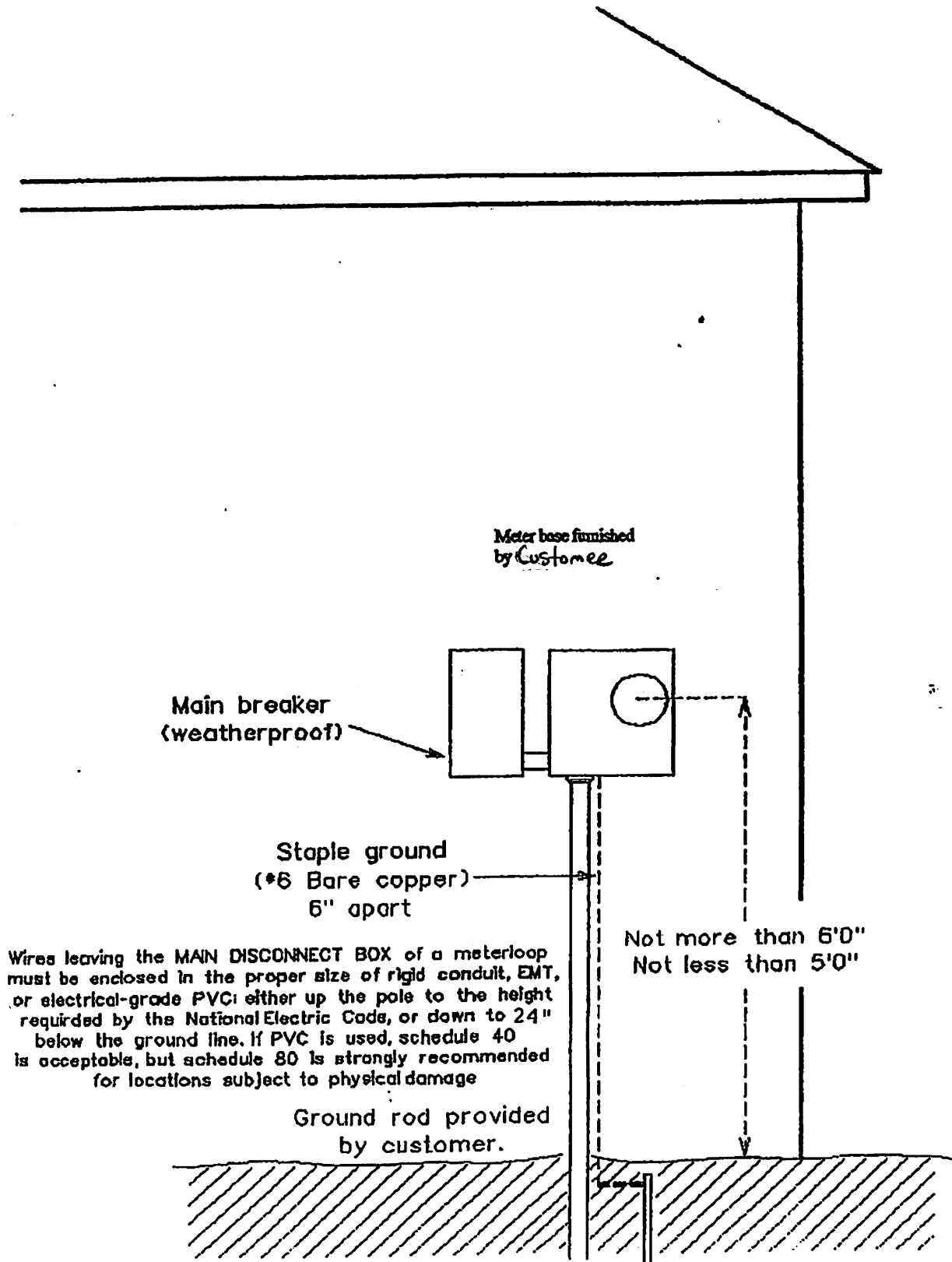
Not less than 5'
 Not more than 6'

Ground rod provided by City of Llano

Cust. to furnish a minimum of 12" of #6 bare copper extending out of breaker box to be connected to neutral bar, for grounding. Bar must be grounded to breakerbox.

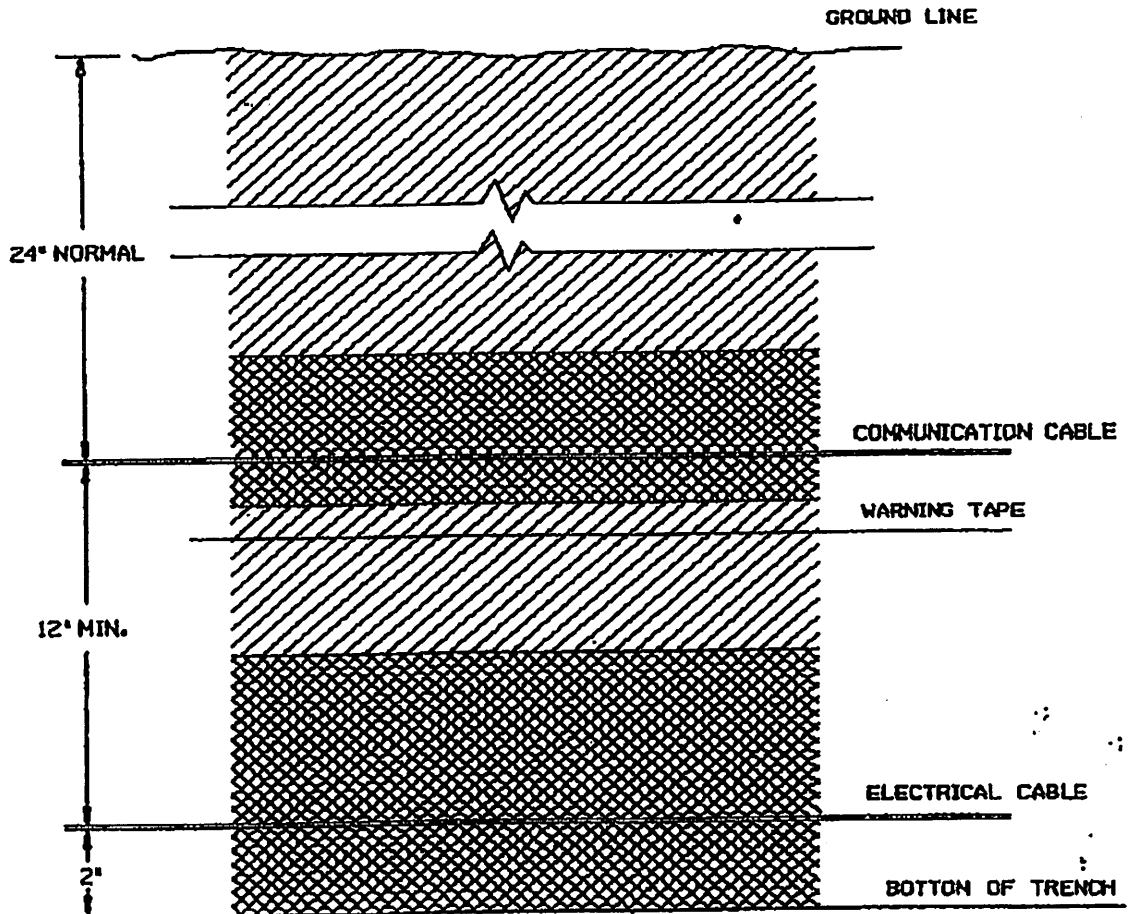
Wires leaving the MAN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT or electrical-grade PVC either up the pole to the height required by the National Electric Code, or down to below the ground line. If PVC is used, schedule 80 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

UNDERGROUND SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING






TYPICAL BURIAL HIERARCHY
OF URD UTILITIES

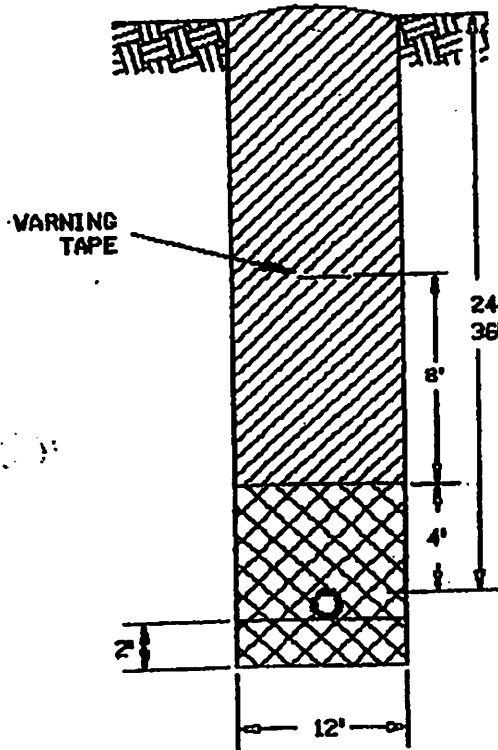
PROFILE VIEW



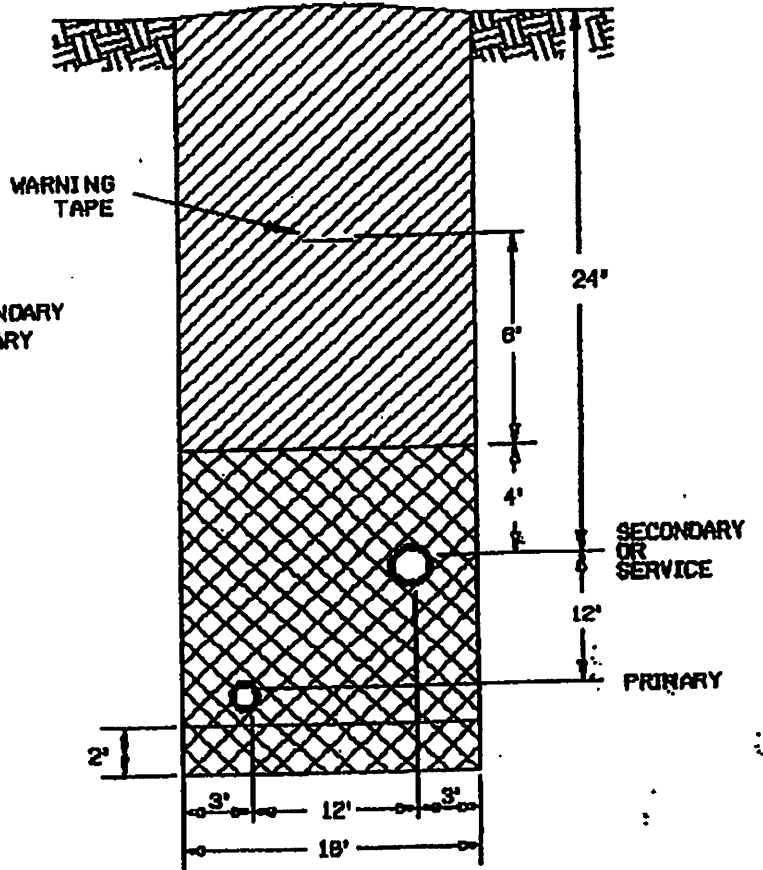
LEGEND

-  BEDDING SAND OR CLEAN SOIL
-  COMPACTED BACKFILL UNLESS OTHERWISE SPECIFIED
-  UNDISTURBED EARTH

TYPICAL TRENCH DETAIL ELECTRICAL ONLY



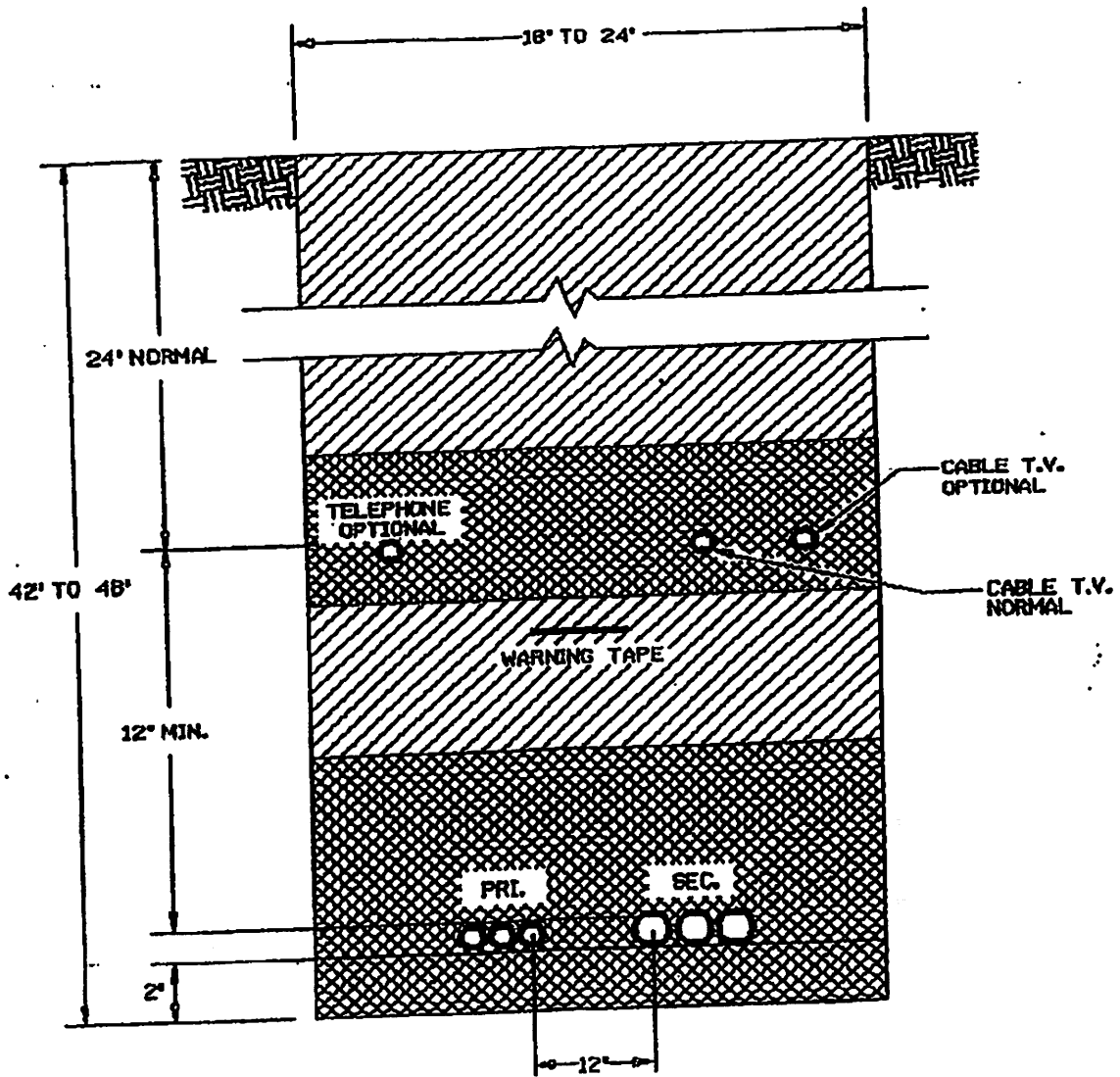
**TRENCHING UNIT
ONE CONDUIT**



**TRENCHING UNIT
MULTIPLE POWER CONDUITS
PRIMARY, SECONDARY OR SERVICE**

TYPICAL TRENCH DETAIL ELECTRICAL W/ CATV & TELEPHONE

TRENCH CROSS SECTION



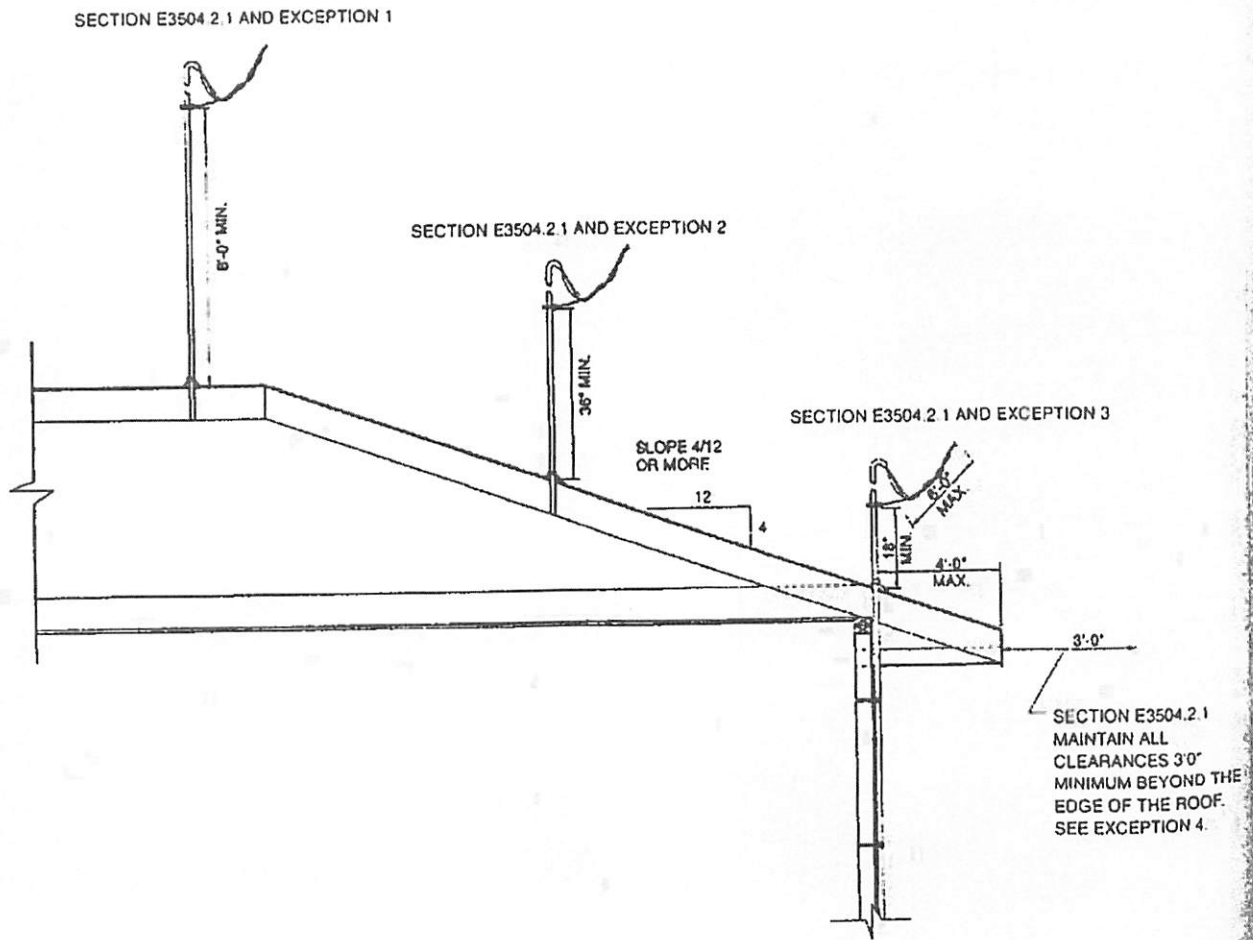
E3504.2 Vertical clearances. The vertical clearances of all service-drop conductors shall be based on a conductor temperature of 60°F (15°C), with no wind and with final unloaded sag in the wire, conductor or cable. Service-drop conductors shall not have ready access and shall comply with Sections E3504.2.1 and E3504.2.2.

E3504.2.1 Above roofs. Conductors shall have a vertical clearance of not less than 8 feet (2438 mm) above the roof surface. The vertical clearance above the roof level shall be maintained for a distance of not less than 3 feet (914 mm) in all directions from the edge of the roof. See Figure E3504.2.1.

Exceptions:

1. Conductors above a roof surface subject to pedestrian traffic shall have a vertical clearance from the roof surface in accordance with Section E3504.2.2.

2. Where the roof has a slope of 4 inches (102 mm) in 12 inches (305 mm), or greater, the minimum clearance shall be 3 feet (914 mm).
3. The minimum clearance above only the overhanging portion of the roof shall not be less than 18 inches (457 mm) where not more than 6 feet (1829 mm) of conductor length passes over 4 feet (1219 mm) or less of roof surface measured horizontally and such conductors are terminated at a through-the-roof raceway or approved support.
4. The requirement for maintaining the vertical clearance for a distance of 3 feet (914 mm) from the edge of the roof shall not apply to the final conductor span where the service drop is attached to the side of a building.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE E3504.2.1
CLEARANCES FROM ROOFS